(a) whether it is a fact that B.A.R.C., Bombay was involved in the fields of research other than nuclear science;

(b) if so, what are the respective subjects;

(c) whether there is any commercial exploitation based on the result of the research of BARC, Bombay;

(d) if so, what are the details thereof; and

(e) whether BARC has got any scheme for commercial use of any product based on the result and achievement of their research ?

THE MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS (SHRIMATI MARGARET ALVA): (a) and (b) In addition to research in Nuclear Sciences, Bhabha Atomic Research Centre has also developed strong basic research groups in allied areas of Physics, Chemistry, Biology, Engineering and Material Sciences. Indigenous know-how is being continually generated in the high-tech and frontier areas of Science such as Lasers, Accelerators, High Temp Superconductivity, Genetic Engineering, Robotics and Computer Sciences.

(c) and (d) Yes, Sir. From these basic and applied research activities many spin off technologies have been generated which are being shared with other Government Agencies, Public Sector and Private Industries. In addition, the Nuclear and Allied Technologies are continually being transferred to other commercial organisation of Department of Atomic Energy such as Electronics Corporation of India Limited, Nuclear Power Corporation, Nuclear Fuel Complex, Board of Radiation and Isotope Technology and Heavy Water Board.

(e) Bhabha Atomic Research Centre has constituted technology transfer group with experts from various professional fields to identify and evaluate technologies developed within the centre for their commercial exploitation. In the past eight years, about 50 technologies have been transferred to seventy-five private industries. Besides, Bhabha Atomic Research Centre has been providing know-how and consultancy services in various technologies to Government and Public Sector agencies.

Use of Atom for peaceful purposes

1114. SHRI TINDIVANAM G. VENKATRAMAN : Will the PRIME MINISTER be pleased to state :

(a) what are the latest achievements of Government towards "Atom for peace" principle to the society at large; and

(b) whether Government propose to concentrate on the atom experiments to find out an alternative to petrol which will reduce foreign exchange crisis ?

THE MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES AND PENSIONS (SHRIMATI MARGARET ALVA): (a) Our programmes in Department of Atomic Energy are directed towards peaceful applications of atomic energy. The R&D developed at Bhabha Atomic Research Centre is primarily being used for the production of electricity from Nuclear Power Reactors and for the production and applications of Radioisotopes in Medicine, Industry and Agriculture. Among the seven Research Reactors commissioned till now in Bhabha Atomic Research Centre, the 100 MW Research Reactor Dhruva has been operating well and its high neutron flux as well as other experimental facilities have enhanced our capabilities in isotope production and in R&D in nuclear sciences and engineering. R&D is being continued both for Fast Breeder Reactors and on Uranium-233 Fuelled Reactor Systems with a view to ultimately utilise our vast Thorium-232 reserves. In this regard, the latest Research Reactor Puranima-III was commissioned at Trombay in November 1990 using Uranium-233 as fuel.

Apart from the Nuclear Power Programme, Bhabha Atomic Research Centre has taken an active role in the exploration and promotion of applications of Radioisotopes in Medicine, Industry and Agriculture which can be judged from the fact that one milionth consignment of Radioisotope was completed in July 1991. In

January 1992, a Sewage Sludge Hygenisation Research Irradiator (SHRI) facility was commissioned at Vadodara for disinfacting sewage sludge generated in the city. Bhabha Atomic Research Centre also has many achievements in advanced high technology areas like Lasers, Accelerators, Superconductivity and other frontier areas of science. Spin-off technologies are also continually being developed and transferred to private and public industrial sector industries for commercial exploitation.

(b) No, Sir. Bhabha Atomic Research Centre is conducting R&D in Nuclear Power but not with an aim to find an alternative to petrol. However production of electricity by nuclear reactors can bring down the use of oil by its use in transport sector such as in Railways and battery powered vehicles.

नरोरा परमाणु विद्युत संयंत्र द्वारा परमाणु विद्युत का उत्पादन

1115. **चौधरी हरि सिंह** : क्या **प्रधान मंत्री** यह बताने की कृपा करेंगे कि :

(क) क्या यह सच है कि नरोरा परमाणु विद्युत संयंत्र की सभी इकाइयां परमाणु विद्युत का उत्पादन कर रही हैं, यदि हां तो इस संयंत्र की प्रत्येक इकाई में प्रतिदिन कितने विद्युत का उत्पादन किया जा रहा है;

(ख) उपरोक्त संयंत्र द्वारा उत्पादित विद्युत का उपभोग कौन-कौन से राज्य करते हैं, साथ ही प्रत्येक राज्य द्वारा इस विद्युत की कितनी मात्रा का उपभोग किया जा रहा है; और

(ग) क्या सरकार नरोरा में ही एक दूसरा परमाणु विद्युत संयंत्र लगाने का विचार रखती है ?

कार्मिक, लोक शिकायत और पेंशन मंत्रालय में राज्य मंत्री (श्रीमती मारग्रेट आल्वा) : (क) जी, हां। नरोरा परमाणु बिजलीघर के पहले यूनिट ने वाणिज्यिक स्तर पर बिजली का उत्पादन करना 1-1-1991 से शुरू कर दिया था। नरोरा परमाणु बिजली घर के दूसरे यूनिट को उत्तरी ग्रिड से पहली बार 3-1-1992 को जोड़ा गया था और वर्तमान स्थिति अनुसार परमाणु ऊर्जा नियामक बोर्ड ने इस यूनिट को अपने पूरे विद्युत स्तर के 50 प्रतिशत तक के स्तर पर काम करने के लिए प्राधिकृत किया हुआ है। मार्च और अप्रैल, 1992 के महीनों में, पहले यूनिट के परिचालन का विद्युत स्तर 150 से 175 मेगावाट के करीब रहा तथा दूसरे यूनिट का 75 से 100 मेगावाट के करीब रहा। 175 मेगावाट और 100 मेगावाट विद्युत स्तर पर बिजली का प्रतिदिन सकल उत्पादन क्रमशः 4.2 मिलियन यूनिट और 2.4 मिलियन यूनिट बैठता है।

(ख) नरोरा परमाणु बिजलीघर द्वारा उत्पादित बिजली का इस्तेमाल नीचे दिए आवंटन के अनुसार जोकि केन्द्रीय ऊर्जा मंत्रालय, विद्युत विभाग द्वारा अनुमोदित है, उत्तरी विद्युत क्षेत्र के लाभभोगी राज्यों द्वारा किया जाता है :

चंडीगढ़	–1.1 प्रतिशत
दिल्ली	–10.6 प्रतिशत
हरियाणा	–6.4 प्रतिशत
हिमाचल प्रदेश	–3.2 प्रतिशत
जम्मू और कश्मीर	–7.4 प्रतिशत
पंजाब	–11.4 प्रतिशत
राजस्थान	–9.6 प्रतिशत
उत्तर प्रदेश	–35.1 प्रतिशत
अनावंटित	–14.9 प्रतिशत

(ग) जी, नहीं।

Purchase of two light Water Nuclear Reactors

1116. SHRI KAPIL VERMA :
SHRIMATI VEENA VERMA :

Will the PRIME MINSTER be pleased to state :